MARINE REVIEW.

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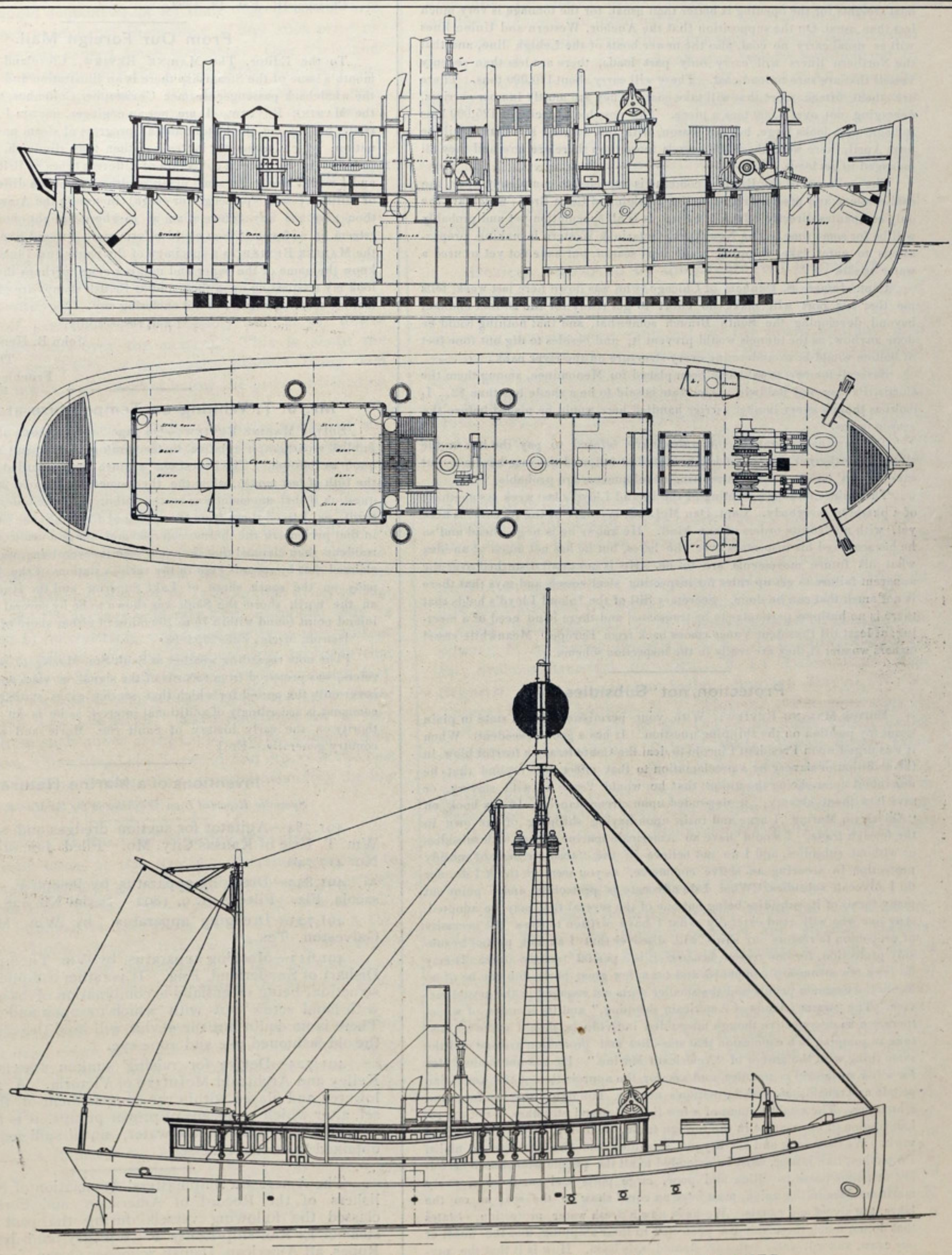


PLANS FOR FIVE WOODEN LIGHT-SHIPS FOR THE LAKES.

For description see Page 8.

A View of the Coal Situation from Buffalo.

Special Correspondence to the MARINE REVIEW.

BUFFALO, N. Y., Feb. 23.—Hard coal shippers are beginning to look to spring business. They admit that the winter is going to use up all the coal that went up the lakes last season and that there will be a rush for tonnage when the season opens. The prospect of a late opening here is good, for the light snow has insured very heavy ice on this lake. The prospect of better coal freights for the opening is better than usual, for the tonnage is very much less than usual. On the supposition that the Anchor, Western and Union lines will as usual carry no coal, also the newer boats of the Lehigh line, and that the Northern liners will carry only part loads, there are less than seventy vessels that are sure to load coal. These will carry about 110,000 tons. There are about fifteen more that will take coal. They are mostly lumber carriers, averaging not over 1,000 tons a piece. This possible capacity of 125,000 tons to begin with looks large, but last season, with the demand less than it will be next April, there were about 100 vessels more than there are now and they all managed to get loads.

The collapse of the Reading combine is expected to completely upset the coal combine and possibly reinstate the Lehigh and Coxe Bros., which are the only companies directly affected by it. It is all speculation yet and probably will be for some time. The New York, Ontario & Western is making preparations to enter lake shipping trade next season, but have not yet secured a water trestle.

Capt. James S. Dunham of Chicago, who was down here last week, tells me that his port will make no effort to get ready for the 20-foot channel beyond developing the South Branch somewhat, and that nothing could be done anyhow, as the tunnels would prevent it, and besides to dig out four feet of bottom would be to undermine every structure on the river bank.

Several lumber tows have been placed for Menominee, among them the Curtis, Pawnee and Baldwin. The rate is said to be a shade less than $2. It looks as though every lumber carrier handled here would be placed before the season opens.

The marine insurance companies have refused to pay the loss on the steamer Northerner, burned at L'Anse late last fall, and the case has been put into lawyers' hands. Some interesting developments are probable.

The failure to hold a meeting of the Inland Lloyd's last week is something of a puzzle to everybody. Capt. Dan McLeod, manager of the register, is here yet, with no definite orders of any kind. He knows he is to go ahead and so he has scattered his inspectors over the lakes, but he has not much of an idea what his future movements are to be. He is not at all disturbed over the apparent failure to get up rules for inspecting steel vessels and says that there is not much that can be done. Secretary Sill of the Inland Lloyd's holds that there is no business particular to be transacted and there is no need of a meeting, at least till President Vance comes back from Europe. Meanwhile vessel owners wonder if they are really in the inspection scheme.

Protection, not "Subsidies."

EDITOR MARINE REVIEW: With your permission, I will state in plain terms my position on the shipping question. It has a good precedent. When it was urged upon President Lincoln to deal the Confederacy a fearful blow, in the abolition of slavery by a proclamation to that effect, he replied that he was intent upon saving the union; that he would "save it with slavery, or save it without slavery;" it depended upon circumstances. In my book on "Americain Marine" I urge and insist upon having shipping of our own in the foreign trade. I would have an Americain marine, either with subsidies or without subsidies, and I do not believe in the "absolute need of subsidy protection in securing an active commerce," as you seem to think I do, nor do I advocate subsidies. What I do advocate is protection, and I point out many forms of it, subsidies being but one of the several that may be adopted. Any one who will read carefully what I have written to show the necessity of protection to restore our ships will discover that I am not partial to subsidy protection, for one reason, because it is a partial remedy only. It may do for a few steamship companies and for a few great ports, but can be of no use to the common people and the smaller ports not engaged in the postal service. The "warm friends of Americain shipping," and its enemies, of whom there are so many active though misguided individuals, should make no mistake in jumping to a conclusion that subsidies and protection are one and the same thing with the author of "Americain Marine." He has not made a plea for a few steamship companies, and ask for the approbation of the Americian people as a rehabilitator of the nation's marine. The like of that is a farce and a humbug. The establishment of a few lines of postal steamers is not the rehabilitation of our marine in the foreign trade, though it may begin the good work. We must look and act beyond subsidies and the carrirge of mails. Protection, like justice, must be extended to all the people who choose to follow maritime pursuits. Rich and poor, large ports and small ones, every maritime state in the union, must have an equal show on the sea, as on the lakes, the rivers and canals. We have now a fresh water protection. States that do not touch the ocean are protected in their shipping, and the finest of our coast, and salt-water states are denied this boon. How is it that the protected shipping interests of Ohio turns up its nose at the unprotected vessel interests of Virginia and Massachusetts? Why should Michigan have a protected marine, and Maryland, Maine and Georgia be denied the same fair play to their more important industry? Let us talk sense, and be just in our views. The cause I advocate is the cause of American right, of dignity, and independence. I speak for the people and for public interest, when I urge justice and protection for all, and advocate doing our own trade with our own shipping.

No. 45 LaSalle Ave., WM. W. BATES.
Chicago, Ill., Feb. 18, 1893.

From Our Foreign Mail.

To the Editor, The MARINE REVIEW, Cleveland—Friend: In this month's issue of the Steamship there is an illustration and short description of the whaleback passenger steamer Christopher Columbus, which is taken from the MARINE REVIEW. I am not an engineer, nor am I connected with that trade, bnt to me the history and all progress of steam navigation has a fascination, which seems to increase rather than diminish. I have made some progress in forming a collection of different types of British steam-shipping, and I would like to get some prints or drawings of the different types of steam or sailihg vessels, (passenger or cargo) in use on the American lakes. Could thou give me any informatian as to where I might obtain them? I would esteem it a favor if thou could inform me. I would like to obtain a copy of the MARINE REVIEW as a specimen of the paper and illustrations. As I only know the name of the paper and nothing more, perhaps thou can kindly overlook my trespassing upon thee, and as British stamps are of no value in America, my seeming neglect in not enclosing any.

I am, respectfully,
John B. Henderson,
The "Poplars"
Fritchley near Derby, Eng.

Mr. J. T. Whiting on Temperature at the Sault.

EDITOR MARINE REVIEW;—On page 9 of your issue of the 16th inst., you publish a paragraph relative to temperature at the Sault, etc., from which I quote as follows: "The lowest temperature ever recorded at the Sault was on the 10th of last month, when the thermometor indicated 26 degrees below. I question if that statement was on the authority of the oldest inhabitants of the Sault, as I lived there from the spring of 1848 until the summer of 1855, and in that period saw the thermometer several times down to 40, while the oldest residents then claimed that they had seen it several degrees lower. It was also claimed that by records kept in the various stations of the American Fur Company on the south shore of Lake Superior and the Hudson Bay Company on the north shore the Sault was shown to be by several degrees the coldest inland point found within 75 to 100 miles of either shore of Lake Superior.

Detroit, Mich., Feb. 20, 1893. J. T. WHITING.

[The note regarding weather at Sault Ste Marie, to which Mr. Whiting refers, was prepared from records of the signal service and was intended to cover only the period for which that service gives statistics. Mr. Whitings comment is accordingly of additional interest, as he is an acknowledged authority on the early history of Sault Ste. Marie and the Lake Superior country generally.—ED.]

Inventions of a Marine Nature.

Specially Reported from Washington for the Marine Review.

491,784—Agitator for suction dredges and sand pumps, by Wm. T. Urie of Kansas City, Mo. Filed Jan. 11, 1892, Serial No. 417,740.

491,843—Dredging apparatus, by Joseph E. Kauser of Pensacola, Fla. Filed Apr. 9, 1892. Serial No. 428,518.

491,723—Dredging apparatus, by Wm. M. Douglass of Galveston, Tex.

491,613—Mooring apparatus, by Wm. Thompson and David Dishart of Sunderland, Eng. It is rather complicated in its construction, being essentially a combination of base jaws and bolt with hand screw nut with which to open and close the jaws. There is no doubt but the device will hold the cable, but so will the old fashioned pile and rope-eye.

491,725—Device for raising sunken vessels, by John T. Kelley and Archibald McIntyre of Victoria. A flexible bag is lowered and placed within the compartment of the sunken vessel, after which by means of proper pumps, it is filled with air. Thus the bags displace the water, until sufficient buoyancy is obtained to float the vessel.

The Americain Shipmasters' Association of New York, publishers of the Rocord of Americain and Foreign Shipping, classed the following vessels during the past week: Screw steamer El Rio, ship Emily F. Whitney and bark Joseph A. Ropes, all American; Danish schooner Ocean Traveller and British three-masted schooner Velocity.

Prices of Iron Ore and Lake Freights.

A stir was caused in Cleveland iron circles early in the week by a report that the Metropolitan Iron and Land Company owning the big Norrie mine had sold a block of ore to the Illinois Steel Company at $3.75 a ton, or 75 cents a ton less than the price at which first sales of this ore were made a year ago. Although the ore sales agents understood that the owners of the Norrie, who are very wealthy mining men, had claimed for some time past that they would demand $4.25 for their 1893 product, and were not disposed to exhaust their mine at any such price as that noted, the report caused some comment. One Cleveland firm having close relations with the Illinois Steel Company was informed in answer to an inquiry that the company had purchased no ore for 1893, and that nothing would be done toward purchases until something more definite is known regarding the future of the market for manufactured products. Mr. E. C. Pope, who is the Cleveland sales agent for the Norrie ore, also said that his company had sold no ore and would not consider such a price. The report has been a means of bringing out an expression from ore dealers as to prices, however, and it is generally conceded that $4 for Gogebic Bessemers is the basis upon which opinions are generally based. Some of the sales agents say that although the owners of the Norrie have talked of $4.25 as their price they will probably sell at $4, unless a marked change comes over the market. This is about the present figure on small lots of last year's product being sold from Lake Erie docks, and 50 cents below the price obtained on first sales a year ago.

If the sales market opens at $4 for the better grades of ore, it is certain, of course, that the ore dealers will try to secure reductions on last season's contract rates of lake freights, and notwithstanding the several causes for a strong feeling among vessel owners, they say that they hope to secure some tonnage at $1.15 from Ashland for the season and claim to be in position to charter at $1.20 from the same port, which would be about 90 cents from Escanaba. It is true that last season the average "wild" rate from Ashland was but $1.15 as against $1.25 on season contracts, and the average wild rate from Escanaba only 74 cents as against $1 on contracts, but however true the present claims of the ore shippers may be it seems very probable that more vessels will be held for current rates this season than last, unless the offers for season contracts are based on $1.20 or better from the head of Lake Superior. Extra exertions for a very large output from such mines as the Colby, Norrie, Chapin, Ashland, Minnesota, Chandler, Lake Superior and others is the best evidence of an immense business in ore, notwithstanding the low range of prices in the iron market.

Engines of the new Whitney Steamer.

In a recent issue of the REVIEW reference was made to favorable comment attending the inspection of new engines built by the Frontier Iron Works, Detroit, for the steel steamer for D. C. Whitney, building at the yards of F. W. Wheeler & Co., West Bay City, Mich. Several features of these engines, especially their roominess, were commended. These advantages are due to the fact that the chief draughtsman of the Frontier works served as a lake engineer for a number of years.

The engines, which are illustrated in a supplement showing right and left hand views, are of the three-cylinder triple expansion type, with cylinders 23, 37 and 62 inches in diameter and 44 inches stroke, arranged with the high pressure cylinder in the middle. The high pressure engine is fitted with a piston valve operated by the Joy valve gear as improved by the Frontier works. The intermediate and low pressure engines are fitted with slide valves operated by link gear, the valve of the intermediate engine being double ported and the low pressure treble ported. The valves and ports throughout are calculated for a piston speed of 700 feet per minute. The pistons are made unusually deep, the intermediate and low pressure being 12 inches at the edge, while the high pressure is 14 inches. The crank shaft is in two sections and is 12½ inches in diameter, with journals 20 inches long. The crank pins are 12½x12 inches. The thrust bearing has had special attention and is secured rigidly to the bedplate of the engine with five collars running in a bath of oil. The bedplate is 24 inches deep. The main journals are so constructed that the brasses can be slipped from under the shaft without jacking the shaft up, and the upper and lower brasses are interchangeable. Lubrication is furnished to the main journals from the under side by large compression cups placed on the starboard columns, two for each journal, in addition to the usual cups on the top of journal. All pumps are independent. Improvements in matters of detail, which count for so much with engineers, are very numerous, and these engines have been the subject of much favorable comment from engineers, on account of the attention given to accessibility and room. Nothing is crowded and yet everything is compact. From cards taken from duplicate engines last fall, 1,736 indicated horse power was shown.

Devices Approved by the Steamboat Inspectors.

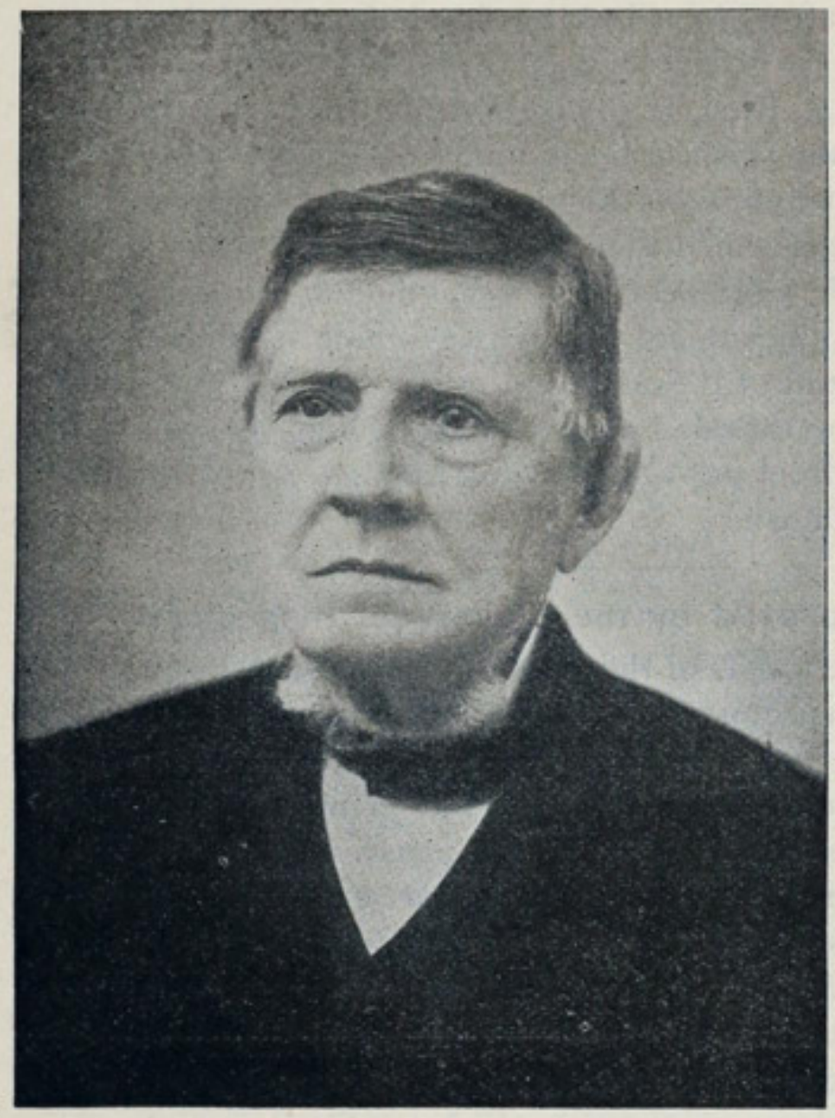
From advance proofs of the report of the annual meeting of the supervising inspectors of steam vessels it is learned that the following devices were approved by the board, and have also received the approval of the secretary of the treasury, as required by section 4491, revised statutes: Air mattress, presented by W. H. Huntington, Metropolitan Air Goods Company, Boston, Mass., rated as a single life preserver; Kearns' pop safety valve, J. T. Kearns; J. Walter Douglas' lifeboat; No. 2 Hunt gun (20 inches long, 2½ inches diameter of bore) may be used on steam vessels from 100 to 500 tons when the gun is constructed in all its parts of material same as used in the large Hunt gun already approved by the board. The board, under the authority conferred upon it by section 4429, revised statutes, approved the following coil and pipe boilers, when constructed in all their parts of wrought iron or steel plates: Henry Sutter, Griswold pipe generator and the Sutter sectional porcupine boiler; Louis S. Clark, Pittsburg, Pa.; H. H. Frederick, New Orleans (3 horse power); E. A. Madee, Brooklyn, N. Y.; A. E. Cory, Allegheny, Pa.; Stillman Saunders, Providence, R. I.; Wickes Bros., East Saginaw, Mich.; Augustus Bailey, Spuyten Duyvil, N. Y.; Thomas Fearon, Yonkers, N. Y.; Howard steam generator, H. J. Hancock, New York, N. Y.; Coller sectional boiler, Coller Yacht and Engine Works, Detroit, Mich.; Taylor Bros., Trenton, N. J.; Seachrist & Parker, Erie, Pa.; Laughlen & Co., Pittsburg, Pa.; B. Louis Toquet, Westport, Conn.; Warner & Papst, San Francisco, Cal.; Geo. D. Bower, Trenton, N. J.; A. C. Harding, Chicago, Ill.; Fenlayson & Popkins, Detroit, Mich.; Joseph Mohr, Chicago, Ill.

Sales of Vessel Property.

Sales of vessel property reported within the past week are: Steamer Sparta and consort Sumatra and steamer Havana, Orient Transportation Company of Cleveland to Alvin Neil and others of Port Huron, $65,000; steamer Ionia, W. A. Loutit of Grand Haven to Frank M. Thompson of Detroit, $80,000; steamer S. C. Clarke, Harris W. Baker of Detroit to J. W. Squires of Marine City, $13,000; schooner Mary E. Cook, Pardee, Cook & Co. of Chicago to E. S. Valentine and F. C. Lorenz of Milwaukee, $3,000; wrecked steamer Progress, in dock at Detroit, insurance companies to John Parker, Alex. I. McLeod, George M. Black and others of Detroit; schooner Nellie Redington, J. A. Redington and J. H. Andrews of Cleveland to owners of Steamer Presley of Cleveland, $24,000; schooner C. A. King, T. Hurley of Detroit to W. E. Coulter and William Dennee of Detroit, $6,000; barge Brooklyn, E. Ashley of Toledo to W. E. Coulter and William Dennee of Detroit, $3,500.

A Pioneer Navigator.

Capt. Levi Allen, the oldest among lake navigators, and one of the oldest residents of Buffalo, died last week in that city at the age of ninty-one years. He figured very prominently in lake navigation and had much to do with the introduction of steam vessels on the lakes. He began life on the lakes at the age of thirteen years, and commanded several sail vessels before



CAPT. LEVI ALLEN.

steam was introduced. When the first steam vessel, the Walk-in-the-water, was built he took command of her, and was still her captain when she was wrecked in Buffalo bay. In the construction of the well known side-wheel steamers the Niagara and the Buffalo, he was associated with Charles M. Reed of Erie, Pa., and later brought out both of these boats, and is credited also with the command of the Superior, Louisiana and other steamers of the old Reed Line. But at the time when the construction of railroads took a large share of the passenger traffic from the lake routes, Capt. Allen retired from active lake service, and became prominent in civil affairs in Buffalo. He was one of the early collectors of customs at Buffalo under President Taylor.

Plans for Five Lake Light-Ships.

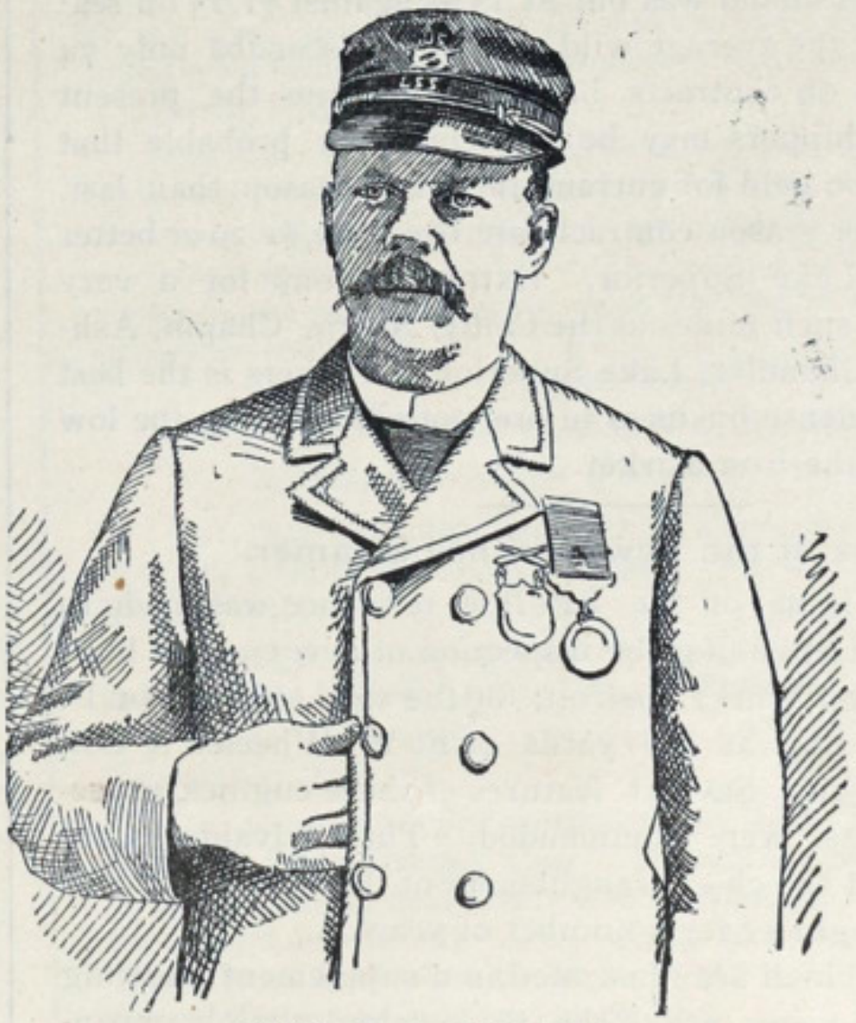
Five light-ships for the lakes, to be known in the light-house service as Nos. 59, 60, 61, 62 and 63, will be built shortly, after the plans shown in engravings on the first page, which are furnished by Commander Robley D. Evans, naval secretary of the light-house board. These plans with three others giving more detail as to construction will be furnished to ship builders within a few days and bids invited on at least one of the boats at once, and probably on all five of them. As shown by the drawings, the vessels are to be of wood, about 80 feet on the water line, 20 feet beam and 8 feet depth of hold, and will contain a boiler for operating the fog signal but no propelling power. The plans certainly indicate a neat vessel for the purpose intended, and are very creditable to the designers, considering that it is expected that the five vessels will be constructed for $85,000, the aggregate amount now available in the treasury. They have been referred to by the light-house board as temporary light-ships, but their frames, according to the drawings, are heavier than those of the ordinary wooden freight vessel on the lakes, and it is the opinion of the vessel owners here that with proper care they can be kept in service in the still waters in which they are to be stationed for thirty years.

For one of the vessels to be built according to these plans, and to be stationed at Bar point, mouth of the Detroit river, there is an appropriation of $25,000. This boat will probably be a little larger than the other four, which must all be built and equipped from an appropriation of $60,000, originally intended for a light station at Eleven-Foot shoal, entrance to Green bay. According to the recommendations of the district officers of the board, the four vessels to be constructed from the appropriation of $60,000 will be stationed as follows: One to cover Eleven-Foot and Corona shoals; one at or near Gravelly island shoal, Poverty island passage; one at the end of Peshtigo shoal, southerly end of Green bay, and one at the lower end of Lake Huron, near Corsica and Northwest shoals, or near Poe's reef, upper end of Lake Huron, but preferably near Corsica shoal.

None of these vessels will be ready for the opening of navigation in the spring, but there is now being constructed under the direction of the board, three small light vessels, about 40 feet long and 12 feet beam, for Detroit river service, and it is probable that one of these will be placed at Bar point, pending the construction of the larger boat for that point. It is expected that the other vessels will be ready some time during the season.

Death of a Well-Known Life Saver.

The sudden death of Capt. Charles C. Goodwin of the Cleveland life saving station, removes one of the best known veterans of the life saving service on the lakes. Capt. Goodwin has always been in apparently good health until the past year, when he complained of neuralgia of the stomach, the disease which at last caused his death. His life has nearly all been spent in active service on the water in various capacities. He was born fifty-three years ago in New England, and at thirteen years of age began sailing on salt water. Before he had reached the age of thirty-five he had been in nearly every part of the globe, and



CAPT. C. C. GOODWIN.

had received many promotions in the service. At that age he began sailing on the lakes and followed this for several years as an officer on several vessels. It was thirteen years ago, when the government established the life-saving station in Cleveland, that he became one of the volunteer men at this station and was soon promoted to the position of captain which he has since held. He commanded the Cleveland crew in some good service in wrecks on this part of Lake Erie.

Iron Mining.

VALUE OF LEADING STOCKS.

Quoted by Chas. H. Potter & Co., No. 104 Superior St. Cleveland, O.

Stocks.	Par Value.	Bid.	Asked.
Cleveland-Cliffs Iron Company	$100 00	$ 51 00	$.....
Champion Iron Company	25 00	.....	35 00
Chandler Iron Company	25 00	40 00	41 00
Jackson Iron Company	25 00	.....	75 00
Lake Superior Iron Company	25 00	26 00	.....
Minnesota Iron Company	100 00	65 00	66 00
Pittsburgh & Lake Angeline Iron Co.	25 00	.....	135 00
Republic Iron Company	25 00	.....	10 25
Ashland	25 00	.....	.....
Section Thirty-three	25 00	1 00	.....
Brotherton	25 00	.....	.....
Iron Belt	25 00	.....	1 90
Aurora	25 00	8 00	9 00

Iron ore dealers who have recently returned from the Mesabi range, among them Mr. James Corrigan of Corrigan, Ives & Co., a firm controlling several properties that have begun development work, are of the opinion that delays encountered since the beginning of winter will greatly reduce the output of ore expected from the Mesabi range during the coming season. Mr. Corrigan, who has spent a great deal of time on the range of late, says that with all good luck the output can not possibly be more than 500,000 tons, and other dealers who were expecting a half million tons from the new district have reduced their estimates to 350,000 or 400,000 tons. The greatest reduction on former estimates is due to the fact that at the Biwabik, where the Kimberly interests centered their operations, and the Mesaba Mountain, the principal Oliver mine, there is convincing evidence that if any ore at all is shipped in 1893 it will be very late in the season. A considerable product from these mines figured in all previous estimates, and failure is not attributed to the extent of the ore deposits, but to the disadvantages encountered in trying to strip the surface with steam shovels. At the Biwabik, where it was expected that all stripping would be done during the winter, the work so far accomplished in the removal of a small portion of the covering has amounted to practically nothing, and time can not be gained in resorting to the sinking of shafts, as such operations must go on slowly under any circumstances. In preparing for the stripping work during the winter the managers of these new mines had expected that snow would come ahead of severe frost and protect the ground, but the contrary was the case, and upon putting the steam shovels to work the surface was found to be frozen to a depth of ten inches or more. The Mountain Iron, owned by the Merritts, and the Cincinnati will make fair shipments, but at the Ohio, which is considered a big mine, nothing is being done to indicate any movement of ore to market this year. The Commodore, formerly the New England, will ship some ore, but not a large amount, and from the Franklin, formerly the Wymer, there are only hopes of shipments. Hale will also market a little ore, but it is non-Bessemer.

The announcement that Mr. W. D. Rees of the Republic Iron Company has been appointed to the positon of assistant treasurer of the Lake Superior Iron Company and will on May 1 succeed Mr. J. S. Fay, Jr., of Boston as treasurer and managing director of that company has been very favorably received by stockholders. Immediately following the April meeting, the office of the Lake Superior Company will be removed from Boston to Cleveland, and Mr. Rees will assume the active duties which Mr. Fay relinquishes in order to secure a rest. The sales agency will remain in the office of Harvey H. Brown & Co., Cleveland. Mr. Rees has been a director of the Lake Superior Company for a number of years, and his thorough knowledge of the ore and vessel business, will undoubtedly result profitably to to this corporation in the management of a property that, next to the Minnesota, is probably the most valuable in the Lake Superior region.

A contract has just been closed by the Zenith Iron Company of Duluth for 1,000 tons of its ore for immediate delivery at the West Duluth blast furnace for mixing with the Cincinnati ore now in use at the furnace. The contract will probably be followed by a larger one. These mixtures are found to give better results than a straight run on one ore. The Zenith mine at Ely is now down five levels and will largely increase its shipments in 1893. Last week two excellent discoveries of ore were made in the fifth level. It is of a very high grade. Of the entire 15,000 tons shipped east last year the average analysis was 64.27 metallic iron and very low in phosphorus.

The Diamond Drill of Crystal Falls says that in a letter to an officer of one of the Crystal Falls mining Companies Mr. W. E. Mack of the firm Mack, Nye & Co., Cleveland, makes inquiry as to the condition of several mining properties in the district and says: "I am clearly of the opinion that before long we shall have a reaction that will make mining again profitable and it is therefore for such reasons that I think it well to take hold of good properties if they can be handled upon a right kind of basis. I shall be glad to do what I can to get some good non-Bessemer property in shape to ship ore."

A story from Duluth, the mecca of sensational newspaper yarns, says the Minnesota Iron Company has endeavored in every possible way to get control of the Duluth, Mesaba & Northern Railroad, and the properties owned by the Merrits on the Mesabi range. Matters reached such a shape, it is claimed, that officers of the Minnesota Iron Company made an offer to Alfred Merritt of $8,000,000 for the properties, but the proposition was declined.

Number and Capacity of Grain Elevators.

Following is a statement showing the number and capacity of grain elevators at New York and at the principal grain shipping ports on the lakes:

Port of	Number.	Storage Capacity
Chicago	27	30,075,000 bu.
New York	27	27,275,000 "
Duluth-Superior	17	21,200,000 "
Buffalo	32	15,000,000 "
Toledo	13	7,357,000 "
Milwankee	10	5,430,000 "
Detroit	4	3,100,000 "
Port Huron	6	1,670,000 "

Stocks of Grain.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Feb. 18,1893:

	Wheat, bu.	Corn, bu.
Chicago	14,533,000	6,617,000
Duluth	15,912,000	341,000
Milwaukee	2,065,000	18,000
Detroit	1,953,000	11,000
Toledo	3,655,000	1,498,000
Buffalo	2,821,000	85,000
Total	40,939,000	8,570,000

At the points named there is a net decrease for the week of 95,000 bushels of wheat and a net increase of 156,000 bushels of corn.

Power of Attorney from Lloyd's Underwriters.

A number of Underwriters at Lloyds, London, recently gave power of attorney to Messrs. Hall & Henshaw, New York brokers who engage in securing risks in this country for English underwriters, and Fairplay of London makes the following comment on their action: "Lloyd's underwriters have for some time done business in all parts of the world, except the United States, through an organization which has its centre in Bucklersbury, London. This association would gladly have opened up in the United States, but was not in a position to make the deposits demanded by the authorities of the various states. It is to be presumed that the Lloyd's names now represented in New York by Messrs. Hall & Henshaw, have made deposits with the authorities of the state of New York. How much have they had to set aside in this way? And, further, what class of business have they arranged with the New York firm to write for them? If the idea is to go in for lake business, the results will very probably be unsatisfactory."

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

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SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,600 vessels, measuring 1,154,870.38 tons in the lake trade. In classification of this fleet the lakes have more steamboats of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of vessels of 1,000 to 2,500 tons on the lakes on June 30, 1891, was 310 and their aggregate gross tonnage 512,787.58; in all other parts of the country the number of this class of vessels was, on the same date, 213 and their gross tonnage 319,750.84. The classification of the entire lake fleet is as follows:

Class.	Number.	Tonnage.
Steam vessels	1,592	756,751.53
Sailing vessels	1,243	325,131.06
Canal boats	703	72,515.42
Barges	62	20,472.37
Total	3,600	1,154,870.38

Tonnage built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	No. of boats.	Net Tonnage.
1887	152	56,488.32
1888	222	101,102.87
1889	225	107,080.30
1890	218	108,515.00
1891	204	111,856.45
Total	1,021	485,042.94

St. Mary's Falls and Suez canal traffic: Number of boats through St. Mary's Falls canal in 1890, 228 days of navigation, 10,557; tonnage, net registered, 8,454,435. Number of boats through Suez canal during 1890, full year, 3,389; tonnage, net registered, 6,890,014. Number of boats through St. Mary's Falls canal in 1891, 225 days of navigation, 10,191; tonnage, net registered, 8,400,685. Number of boats through Suez canal during 1891, full year, 4,207; tonnage, net registered, 8,698,777. Number of boats through St. Mary's Falls canal in 1892, 233 days of navigation, 12,580; tonnage, net registered, 10,647,203. Number of boats through Suez canal during 1892, full year, 3,559; tonnage, net registered, 7,712,028.

Entered at Cleveland Post Office as Second-class Mail Matter.

THERE never was any good reason for retaliation as a result of the canal tolls question. The controversy was undignified from the beginning, and now that it is over with there should be no delay in settling another matter of importance to lake vessel owners, the question of reciprocity in wrecking. In the senate a few days ago, Mr. McMillan of Michigan introduced a resolution providing that "the secretary of state be requested, if not inconsistent with the public interests, to inform the senate in regard to the present status of the arrangements to provide for reciprocal wrecking privileges, to be enjoyed by the citizens of the United States and of the Dominion of Canada, on the great lakes and their connecting waters, under the laws already enacted by the respective governments." This will give the state department an opportunity to recommend to congress any action that may be needed to put this thing in shape for an immediate proclamation of reciprocity in wrecking by the president. Mr. Wharton, assistant secretary of state, promised Secretary Keep of the Lake Carriers' Association on Friday last that this question will have his immediate attention.

ACCORDING to President Harrison's proclamation the Canadian order in council which settles the canal tolls question reads as follows: "For the season of 1893 the canal tolls for the passage of the following food products—wheat, Indian corn, peas, barley, rye, oats, flaxseed and buckwheat—for passage eastward through the Welland canal will be 10c per ton, and for passage eastward through the St. Lawrence canals only 10 cents per ton, payment of the said toll of 10 cents per ton for passage through the Welland canal to entitle these products to free passage through the St. Lawrence canals." It is to be hoped that there is nothing ambiguous about this order. The president says that he has satisfactory assurance that this order removes the discriminating provisions of previous orders, and he has accordingly revoked the order under which tolls were collected last season on Canadian freight passing through the St. Mary's Falls canal.

IN a recent note in this column an error was made in expressing regret that no representative of lake shipping interests was in the council of the new Society of Naval Architects and Marine Engineers. The mistake was made through the telegraphic reports of the election of officers at the first meeting in New York recently being incomplete. From Secretary W. L. Capps of Washington we learn that Messrs. F. E. Kirby of Detroit, John F. Pankhurst of Cleveland and F. W. Wheeler of West Bay City are all members of the council. The lakes would undoubtedly have been given representation on the executive committee but for the necessity of having the members of that committee easily accessible from headquarters.

IN the civil sundry appropriation bill as amended by the Senate the appropriation for the St. Mary's Falls canal work is cut from $2,000,000 to $1,230,000; for Hay lake channel from $500,000 to $225,000 and for the 20 foot channel between Duluth, Chicago and Buffalo from $1,000,000 to $875,000. Gen. Poe was summoned before the Senate committee on appropriations and there stated that the appropriations as reduced would keep the contractors on all of these works busy until Nov. 15, 1894, and on this account there is no ground for complaint regarding the reductions.

CAPT. WM. MACK and his associates on the committee selected to visit Washington in support of an appropriation of $25,000 for dredging at "Collision Bend" are to be congratulated. The money, to be diverted from the Sault lock appropriation, is assured.

CONNEAUT, the new iron ore port on Lake Erie, had some active workers in Washington last week. The $40,000 appropriated in the last river and harbor act can now be applied to the old harbor scheme at that port and will be of immediate use.

Personal Mention.

Mr. M. A. Bradley of Cleveland is at Hot Springs.

At the annual meeting of the stockholders of the Wheeling & Lake Erie Railway Company, Mr. E. W. Oglebay of the firm of Oglebay Norton & Co., iron ore sales agents of Cleveland, was re-elected to membership in the board of directors. Mr. Oglebay is interested in the ore docks and other terminal property of this company at Huron, O.

Mr. H. M. Hanna's steel yacht Comanche, built by the Globe Iron Works Company, Cleveland, and now at Jacksonville, Fla., will start on a six weeks' voyage to the Bermudas and West Indies in a few days. Ex-Secretary of the Navy Whitney and family and Col. Oliver H. Payne of New York will be Mr. Hanna's guests on this voyage.

In the appointment of Mr. C. B. Calder of Cleveland to the position of engineer surveyor for the Bureau Veritas of France, Capt. F. D. Herriman, representative of that association on the lakes, has undoubtedly made a very wise selection. Mr. Calder was recommended to Capt. Herriman by several builders as well as owners of steel vessels. He retains the position of chief engineer of the Mutual and Menominee lines of steel steamers, under an agreement with the owners that a part of his time be given to the new work, which will involve a technical survey of engines and boilers of all steamers seeking classification in the register of the Bureau Veritas.

Senator Collum has introduced a joint resolution in Congress to transfer the model battleship Illinois to the state of Illinois as a naval armory for the use of the naval militia of the state on the termination of the World's Columbian Exposition. Some opposition to the resolution was shown in the senate, the resolution being referred to the committee on naval affairs, but it is probable that the state will get the "battleship," as it is only a model pile of brick, which will be of no use to anyone else when the fair is at an end.

A Decided Check on the Flyers.

The board of supervising inspectors of steam vessels has made the new rule relative to vessels passing each other in narrow channels on the lakes very plain, and it is expected that there will be strict enforcement of the law, which goes into effect on May 1, next. The flyers can be held in check by the humblest of lumber hookers, if reports are made of violation of the law, the full text of which, taken from advance proofs of the report of the board meeting, just issued, is as follows:

"Rule VIII, pilot rules for lake and seaboard—When steamers are running in the same direction, and the pilot of a steamer which is astern shall desire to pass on the right or starboard hand of the steamer ahead, he shall give one short blast or the steam whistle as a signal of such desire and intention, and shall put his helm to port; or if he shall desire to pass on the left or port side of the steamer ahead, he snall give two short blasts of the steam whistle as a signal of such a desire and intention, and shall put his helm to starboard, and the pilot of the steamer ahead shall answer by the same signals, or if he does not think it safe for the steamer astern to attempt to pass at that point, he shall immediately signify the same by giving several short and rapid blasts of the steam whistle, and under no circumstances shall the steamer astern attempt to pass the steamer ahead until such time as they have reached a point where it can be safely done, when said steamer ahead shall signify her willingness by blowing the proper signals. The boat ahead shall in no case attempt to cross the bow or crowd upon the course of the passing steamer.

"Second. That in the navigable channels on the great lakes and their tributary and connecting waters less than 500 feet in width, no steam vessel shall pass another going in the same direction unless the steam vessel ahead be disabled and signify her willingness that the steam vessel astern shall pass; when the steam vessel astern may pass at a rate of speed not exceeding five miles per hour.

"Third. And when steam vessels running in opposite directions are about to meet in such channels, both such vessels shall be slowed down to a speed not exceeding five miles per hour.

"Fourth. That in such channels the descending steam vessel shall have the right of way. The pilot of such descending steamer shall signify his desire and intention by giving the proper signal before the steamers have arrived at a distance of one-half mile of each other."

Around the Lakes.

Capt. James Stover, for several years master of the steamer N. K. Eairbank, will command the steamer Colonial the coming season.

Lake ship builders will find it to their advantage to write C. H. Burton, Cleveland, O., when they wish to buy reducing valves. The Burton valve is the result of the practical experience of a lake engineer, and it does its work.

Masters and chief engineers of the Canadian Pacific steamers running between Owen Sound and Port Arthur will be the same as last year, viz: Manitoba, Capt. Anderson, Chief Engineer Kenney; Alberta, Capt. Allister, Chief Engineer Cameron; Athabasca, Capt. McDougall, Chief Engineer Lockerbie.

Officers of the Vessel Owners' Towing Company of Cleveland, recently organized and now a stock company, are: C. E. Grover, president; Wm. Kennedy, vice-president; W. A. Collier, secretary, and general manager. The capital is $80,000. The Union Dry Dock Company of Buffalo is building two tugs for this line.

Leathem & Smith of Sturgeon Bay who are engaged in converting the I. N. Foster into a steamer, have purchased the discarded engines of the Northern Michigan line steamer City of Charlevoix. They propose to place in the Foster the steeple-compound engine of the tug A. J. Wright and one of the boilers of the wrecked steamer Calumet, and give the tug, when she is rebuilt, the City of Charlevoix engine and one of the steamer Calumet boilers. Inasmuch as the tug's steeple-compound engine has cylinders 19 and 40 inches in diameter with 30 inches stroke, and the City of Charlevoix engine is a 24x36, the power of the tug will be considerably reduced for future service, while that of the Foster will be ample for all purposes.

Engineers of the Mutual and Menominee lines of steel freight steamers of Cleveland for next season are: Mutual line—Cambria, H. N. Wadleigh; Corona, A. L. Wilcox; Corsica, Wm. Steen. Menominee line—Norman, Clement Clark; Saxon, Wm. Bullock; Briton, O. H. Gillmore; German, G. W. Curtiss; Grecian, Thos. J. Rees; Roman, S. A. Wells.

It is estimated that for the building of ore docks, grain elevators and flour mills at the head of Lake Superior, about 42,000,000 feet of timber will be required during the present year. The estimates are: For Duluth & Iron Range railway docks, 6,100,000 feet; Duluth, Mesabi & Northern, 13,000,000; Duluth & Winnipeg, 4,000,000; grain elevators, 12,000,000; flour mills, 7,000,000.

Capt. McLeod is pushing the work of inspection of wooden vessels for the Inland Loyd's Register. He has the following force of inspectors at work: J. T. Kenney, at Buffalo; A. B. Drake, south shore of Lake Erie; Richard Fitzgerald, Ogdensburgh and Lake Ontario; John Perew, Port Huron and the rivers; L. P. Goodale, Bay City to Michigan City; John McNeil, Chicago; C. K. Moore, west shore of Lake Michigan; Angus McDougall, Duluth.

Steel for the New American Ships.

Reports regarding the big contracts recently awarded by the William Cramp & Son's Ship and Engine Building Company for material to enter into the construction of the five new ships for the International Navigation Company (American line) place the aggregate at 31,300 tons, the largest order for steel ever placed in this country by a single firm. The apportionment was among eastern and western Pennsylvania firms as follows: Wellman Iron and Steel Company of Thurlow, plates for two of the hulls, 9,100 tons; Paxton Iron Company of Harrisburg, plates for two hulls and sixteen boilers, 10,020 tons; Phoenix Iron Company of Phoenixville, steel shapes for all five ships, 6,000 tons; Carbon Steel Company of Pittsburg, plates for boilers for three ships, 1,380 tons; Carnegie Steel Company, plates for one ship, 4,800 tons. The aggregate cost of this steel is about $1,250,000.

Work of Windlasses and Capstans.

A Providence paper gives an account of the floating of the steamer Alert, stranded on the South American coast. The vessel was loaded with coffee and lay broadside on the beach in about three feet on the inshore and five feet on the offshore side. The new Bedford tug Right Arm, the strongest on the coast, accomplished the work of pulling the vessel off. She planted her wrecking anchor in 16 feet of water, 275 fathoms from the vessel. By means of the anchor and a Providence ship windlass, which is also arranged to operate a dredging apparatus, the Right Arm brought the power of eight ordinary tugs to bear on the Alert and she was pulled into deep water without difficulty. The American Ship Windlas Company makes a capstan of recent design, which takes the place of a tug in swinging a bridge at Curacoa, West Indies. Capt. Taber, U. S. engineer corps, says that the Providence steam capstans do as satisfactory work on the Arkansas river as much heavier capstans of other patterns accomplish on steel-hulled snag-boats drawing three feet.

Contract in England for a Lake Vessel.

Capt. John Gaskin of Kingston has just returned from England, where he left a contract with Sir Railton Dixon of Middlesborough on the river Tees for a steel steamer for the Montreal Transportation Company. The boat will be Welland canal size, 253 feet over all, 40 feet beam and 22 feet molded depth. The steamer will have triple expansion engines and will be constructed complete in England. She will be cut in two for passage through the St. Lawrence canals, as was done with the steamers Mackinaw and Keweenaw, built by F. W. Wheeler & Co. of West Bay City, Mich., and sent to the coast.

From the Illustrated Express.

The half-tone portrait of Capt. Levi Allen, which appears on another page in this issue, is from the Illustrated Buffalo Express, copyrighted by Geo. E. Mathews & Co.

Immense Rafting Business.

From Lakes Superior and Michigan, Georgian bay and points on Saginaw bay and Lake Huron there was rafted to Saginaw river mills last season 441,614,329 feet of logs. These figures represent the greater portiou of the business of rafting logs on the lakes, and will serve to show the enormous proportions to which the trade has grown. The total quantity of logs rafted and delivered by lake to the Saginaw district and the amount hauled direct to the mills by rail make the following exhibit of the supply of logs for the Saginaw river mills last season:

	FEET
Rafted out of streams on Saginaw bay and Lake Huron	234,114,329
From Georgian bay to Saginaw river	144,500,000
From points on Lakes Michigan and Superior	63,000,000
By rail direct to river	220,502,770
Total	662,117,099

It will be seen that the amount of logs taken in rafts to the mills is more than double the amount forwarded by rail. At the close of the season there was in the booms at the mills only 20,140,000 feet of these logs.

The abolition of the Canadian log export duty and the investment by Michigan lumbermen in Canadian timber has greatly stimulated the business of rafting logs across the lake to Michigan mills, and in 1892 it attained its greatest proportions. In addition to 144,500,000 feet taken to Saginaw mills from the Georgian bay district of Canada, 40,000,000 feet was rafted to Tawas, Mich.

The Developement of the Steam Engine.

By Prof. R. H. Thurston.

DEVELOPEMENT OF THE MARINE ENGINE.

The early marine engine was an early outgrowth of the work on the steam engine in the latter part of the eighteenth and early portion of the nineteenth century.

In 1690 Papin proposed to use his piston engine to drive paddle wheels to propel vessels, and in 1707 he applied the steam engine which he had proposed as a pumping-engine to driving a model boat on the Fulda at Cassel. His pumping engine forced up water to turn a water wheel, which, in turn, was made to drive the paddles. An account of his experiment is to be found in manuscript in the correspondence between Leibnitz and Papin, preserved in the Royal Library at Hanover.

December 21, 1736, Jonathan Hulls took out an English patent for the use of a steam engine for ship propulsion, proposing to employ his steamboat in towing. He proposed using the Newcomen engine, fitted with a counterpoise weight, and a system of ropes and grooved wheels, which, by a peculiar ratchet-like action, gave a continuous rotary motion. There is no positive evidence that Hulls ever put his scheme to the test of experiment, although tradition does say that he made a model, which he tried with such ill success as to prevent his further prosecution of the experiment.

In 1774, the Comte d'Auxiron, a French nobleman and a gentleman of some scientific attainments, constructed a steamboat, and tried it on the Seine, with the aid of M. Perier. This experiment proving unsuccessful, M. Perier built another boat, which he tried independently in 1775, but was again unsuccessful, owing principally to the small power of his engine. In 1778, and again 1781 or 1782, the French Marquis de Jouffroy, who, in his later experiments, used quite a large vessel, succeeded in obtaining such good results as to encourage him to presevere, but, political disturbances driving him from his country, his labors terminated abruptly.

About 1785, John Fitch and James Rumsey, two ingenious American mechanics, were engaged in experiments, having in view the application of steam to navigation. Rumsey's experiments began in 1774, and in 1786 he succeeded in driving a boat at the rate of four miles an hour against the current of the Potomac at Shepardstown, Maryland. Rumsey employed his engine to drive a great pump, which forced a stream of water aft, thus propelling the boat forward. This same method has been tried by the British Admiralty in the Water Witch, a gunboat of moderate size, using a centrifugal pump to set in motion the propelling stream, and with some other modifications which are decided improvements upon Rumsey's rude arrangements, but which have not done much more than did his toward the introduction of "hydraulic propulsion," as it is now called. John Fitch was an ingenious Connecticut mechanic. After roaming about until forty years of age, he finally settled on the banks of the Delaware, where he built his first steamboat. In 1788 he obtained a patent for the application of steam to navigation. His boat was sixty feet long and twenty wide. The propelling apparatus was a system of paddles, which were suspended by the upper ends of their shafts, and moved by a series of cranks, one to each, taking hold at the middle, and giving them almost exactly the motion which is imparted to his paddle by the Indian in his canoe. Fitch's boat, when tried at Philadelphia, was found capable of making eight miles an hour. It was laid up in 1792.

In 1788 Patrick Miller James Taylor and William Symmington attached a steam engine to a boat with paddle-wheels, which had been built by the first-named, and tried it for the first time on Dalswinton lake, in Dumfriesshire, Scotland. This boat having attained a speed of five miles an hour, another was constructed and was tried in 1789. This vessel was driven by an engine of twelve horse-power, and made seven miles an hour.

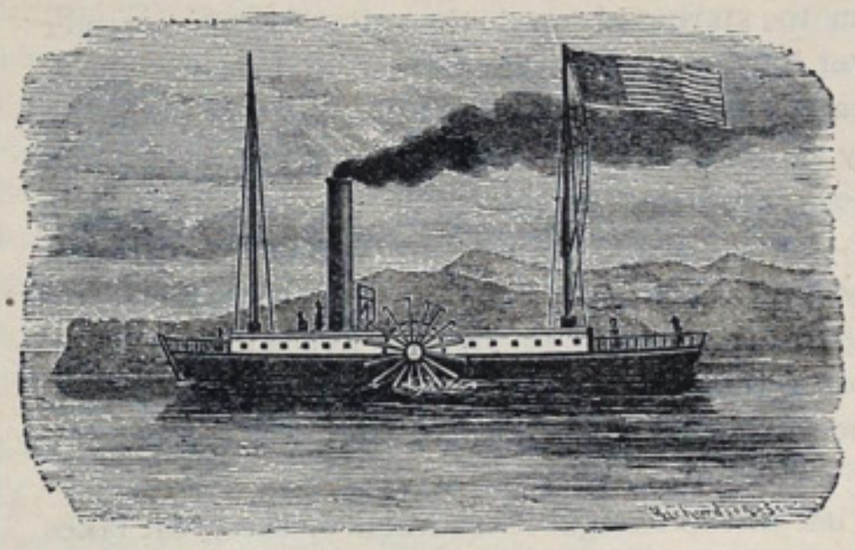


FIG. 17.—THE CLERMONT, 1807.

This result, encouraging as it was, led to no further immediate action, the funds of the experimenters having failed.

In 1801, however, Symmington was employed by Lord Dundas to construct a steamboat, with a design of substituting steam for horse-power on canals. The Charlotte Dundas, as this boat was named, was so evidently a success that the Duke of Bridgewater ordered eight similar vessels for his canal, but his death, soon afterward, prevented the order being filled.

At this time, several American mechanics were also still working at this attractive problem. In 1802-3, Robert Fulton, with Mr. Joel Barlow, in whose family he resided, and Chancellor Livingston, who had also then taken up a temporary residence in Paris, commenced a small steamboat 86 feet long and of eight feet beam. The hull was altogether too slight to bear the weight of the machinery, and when almost completed, the little craft literally broke in two, and sank at her moorings.

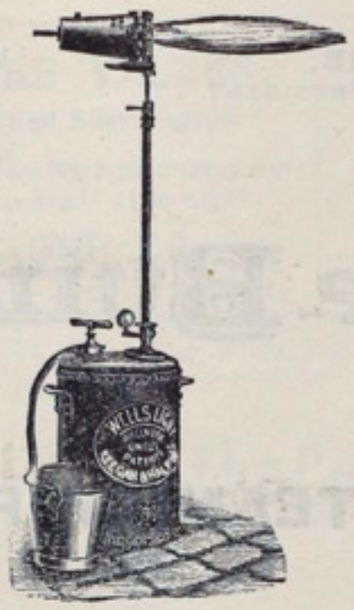
The wreck was promptly recovered and rebuilt, and in August, 1803, the trial trip was made in the presence of a large party of invited guests. The experiment was sufficiently successful to induce Fulton and Livingston to order an engine of Messrs. Boulton and Watt, directing it to be sent to America, where Livingston soon returned. In 1806, Fulton followed, reaching New York in December, and at once going to work on the vessel, for which the English firm sent the engine, without being informed of its intended use. In the spring of 1807 the Clermont (Fig. 17), as the new boat was christened, was launched from the ship yard of Charles Brown, on the East river, New York. In August the machinery was on board and in successful operation. The hull of this boat was 133 feet long, 81 feet beam, and 7 feet in depth. The boat soon afterwards made a trip to Albany, making the distance of 150 miles in 32 hours, running time, and returning in 30 hours. The sails were not used on either occasion. This was the first voyage of considerable length ever made by a steam vessel, and the Clermont was soon after regularly employed as a passenger boat between the two cities.

Fulton, though not to be classed with James Watt as an inventor, is entitled to the great honor of having been the first to make steam navigation an every day commercial success, and of having thus made the first application of the steam engine to ship propulsion, which was not followed by the retirement of the experimenter from the field of his labors before success was permanently insured.

[TO BE CONTINUED.]

Vanderbilt's New Yacht.

Wm. Vanderbilt's new yatch, being built by Messrs. Laird Bros., of Birkenhead, Eng., to replace the Alva will be like an Atlantic liner in appearance. Her chief dimensions are: Length between perpendiculars, 310 feet; extreme beam, 39.3 feet; depth, 25.6 feet; tonnage, about 2,400. She has a cellular bottom and will carry 200 tons water ballast, if required, when light. The power will consist of two sets of triple-expansion engines driving twin screws of bronze. The indicated horse power will be about 5,000, this power being required, as the vessel has to realize a speed on trial of 18 knots, fully loaded, seventeen knots being her guaranteed speed at sea with moderate draught, while under ordinary conditions, without forced draught, she has to do 15 knots. Her bunker capacity will be about 700 tons. She will probably be brig-rigged, and she will carry two steam launches and four other boats. In order to realize the high rate of speed required by Mr. Vanderbilt, her model has to be fine, but seagoing qualities and safety have not been sacrificed to speed.



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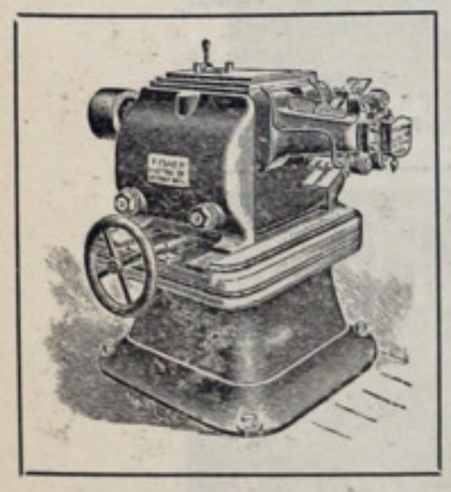

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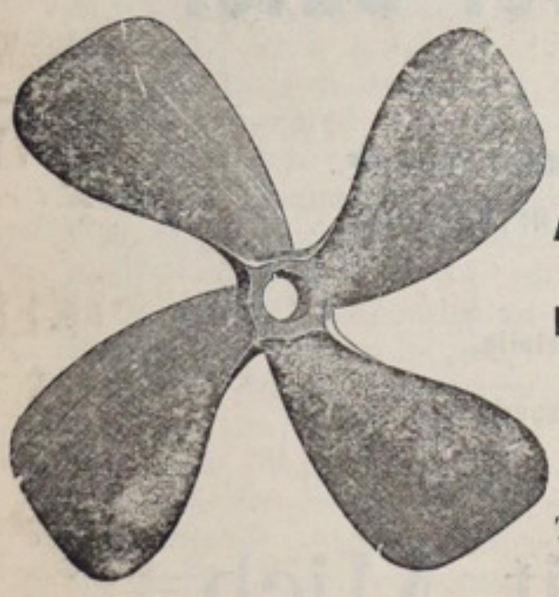

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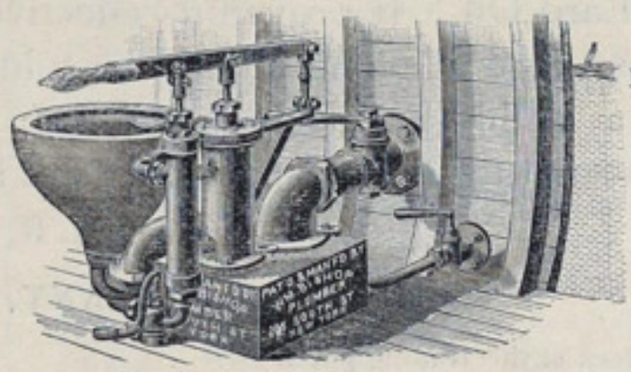

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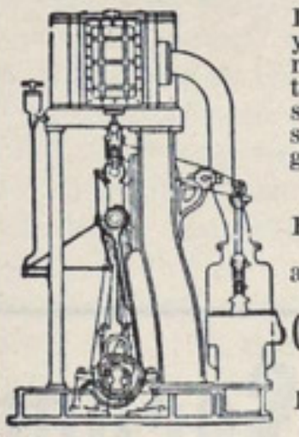

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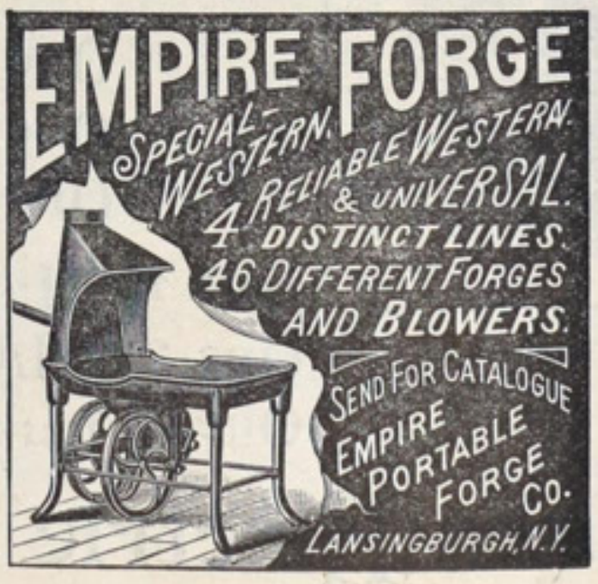

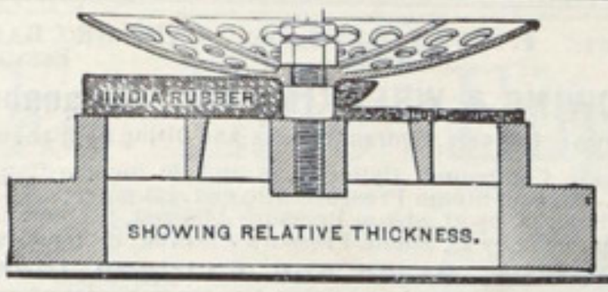

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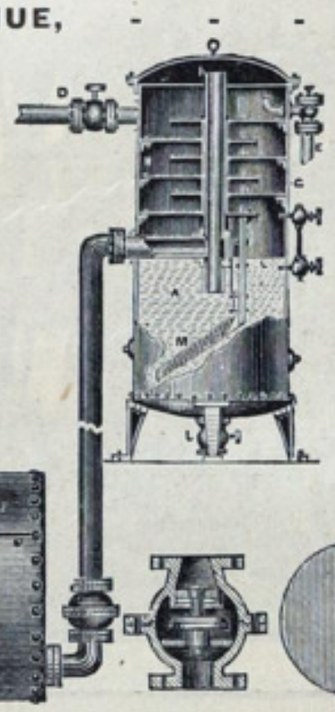

REFERENCES.
A.—Settling chamber.
B.—Boiler.
C.—Feed pipe to boiler.
D.—Steam pipe.
E.—Water supply pipe.
F.—Check valve.
G.—Spray disks.
H.—Spray chamber.
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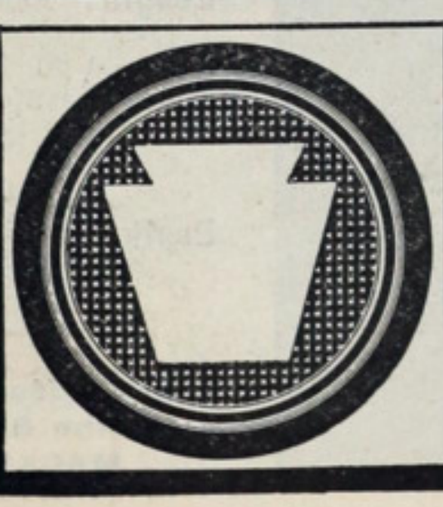

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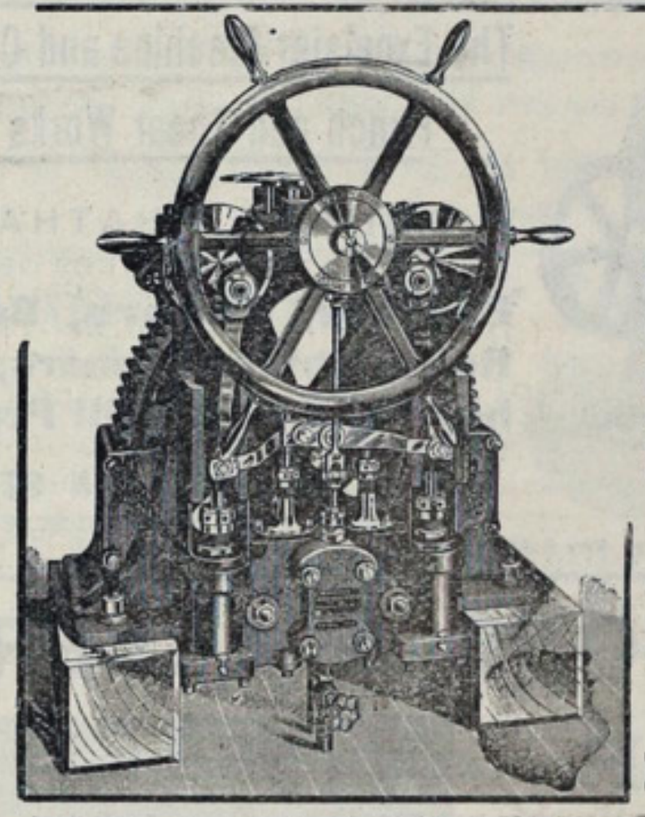

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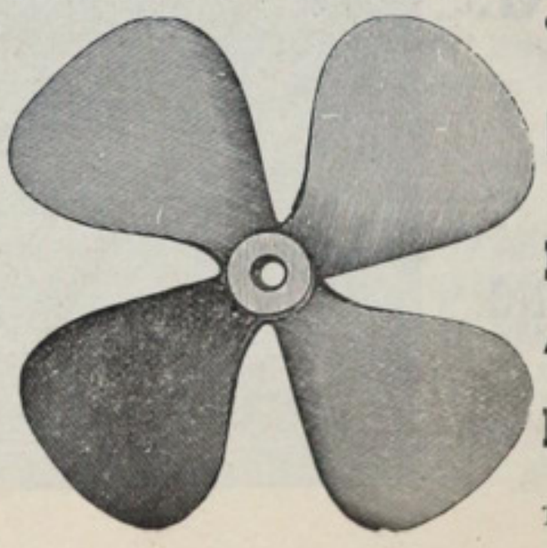

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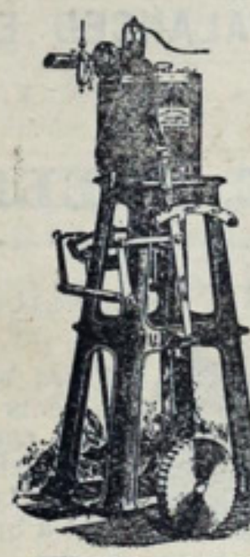

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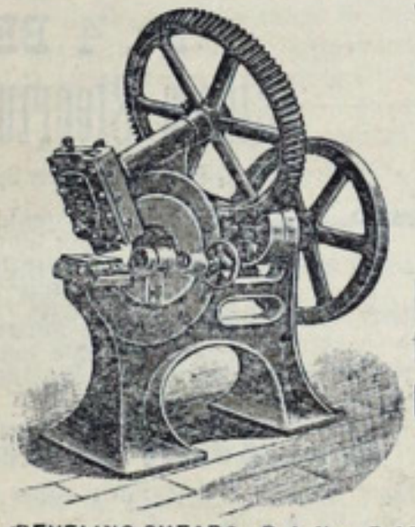

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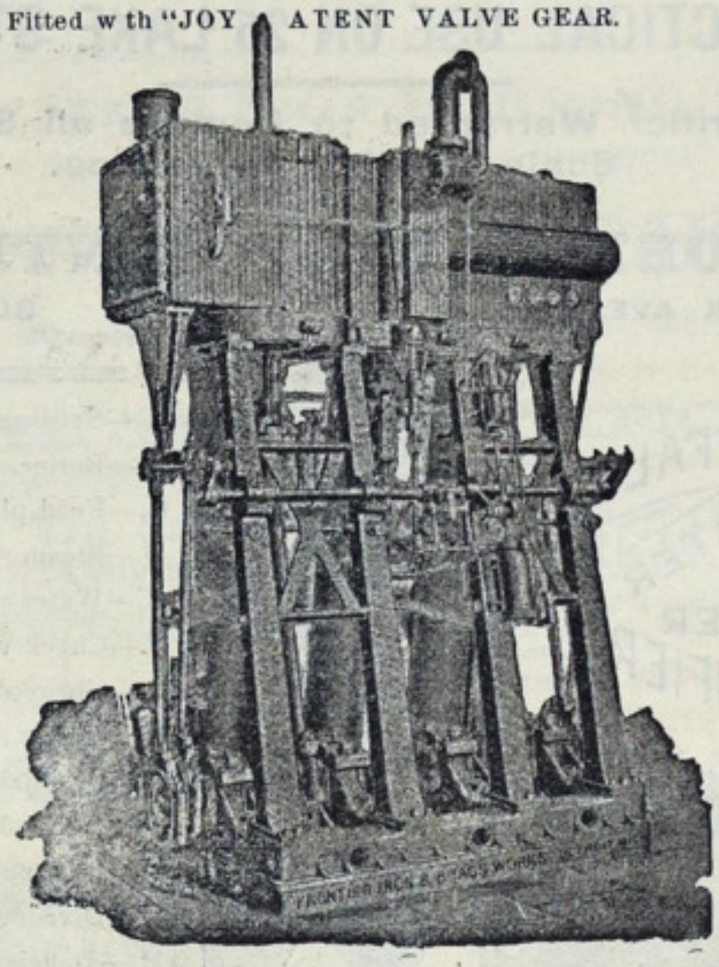

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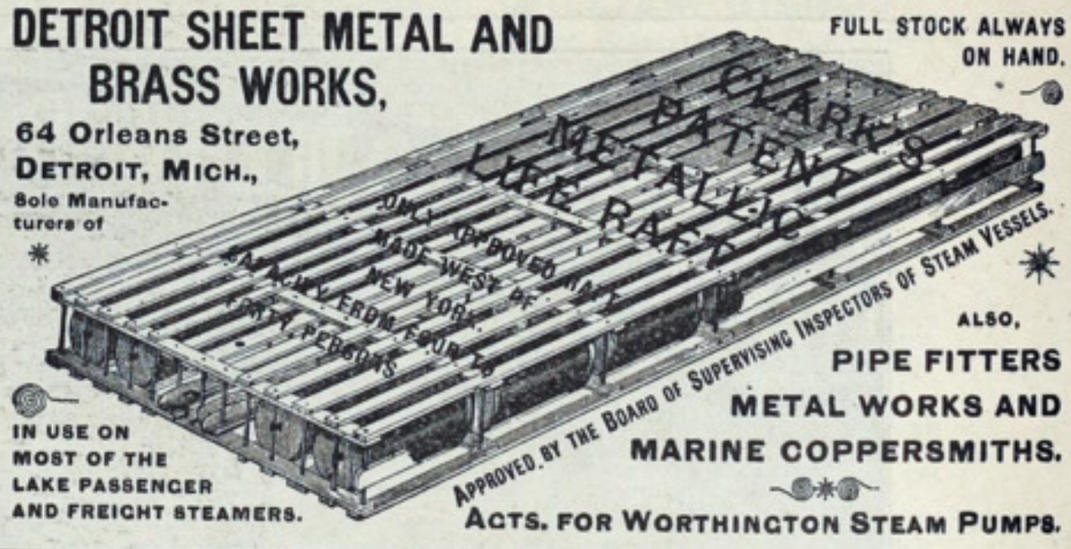

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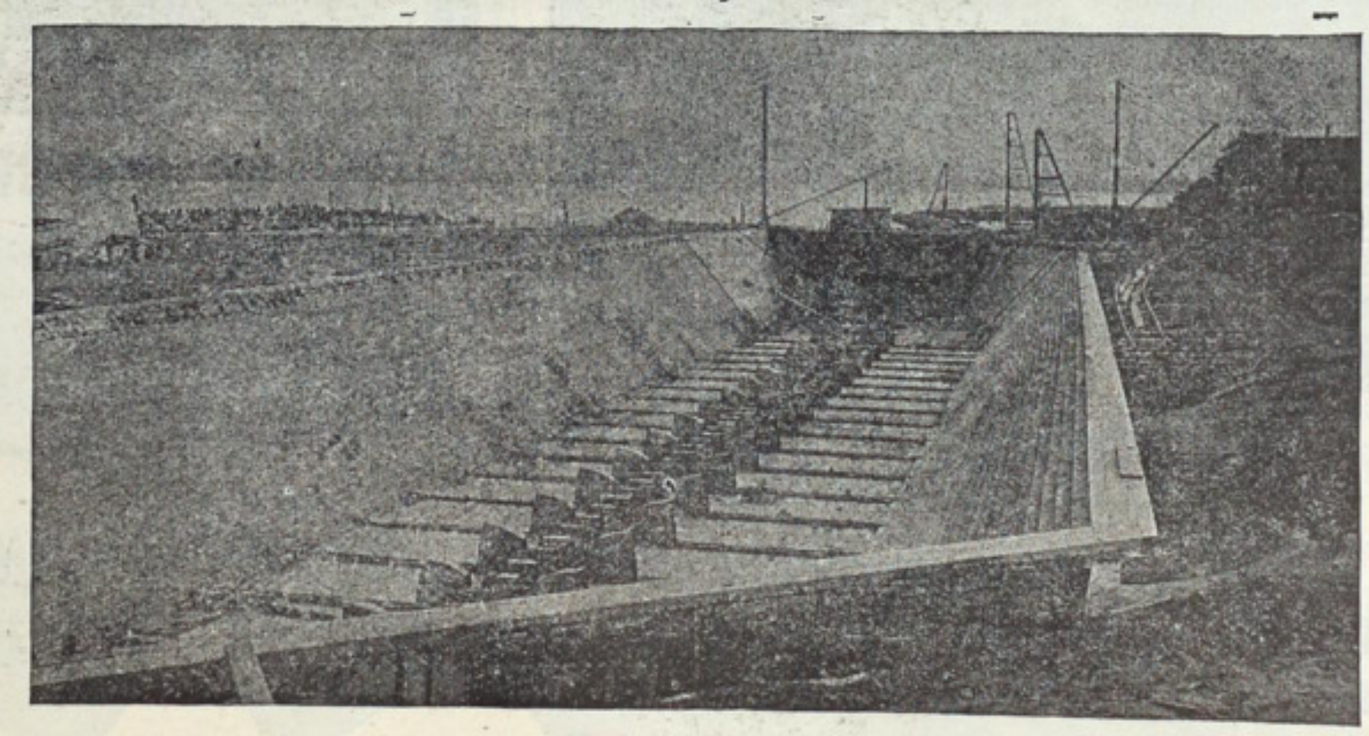

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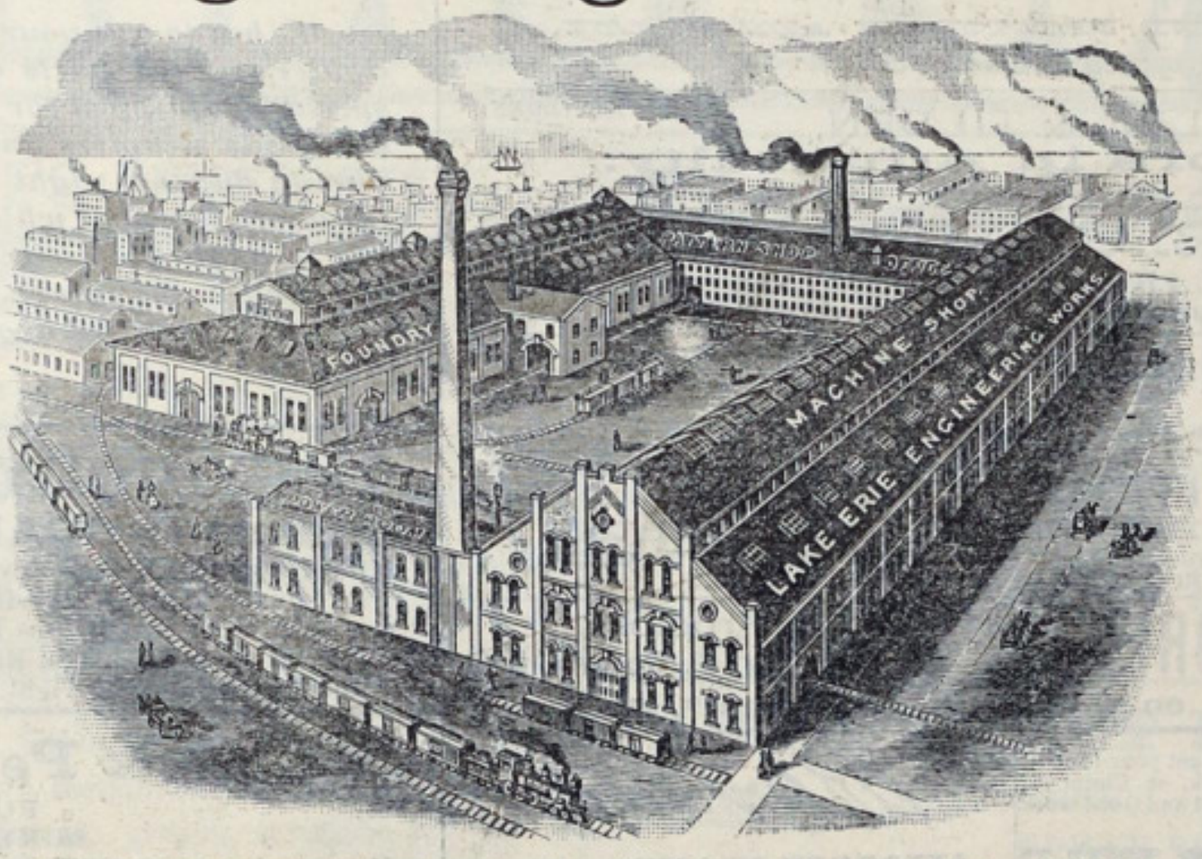

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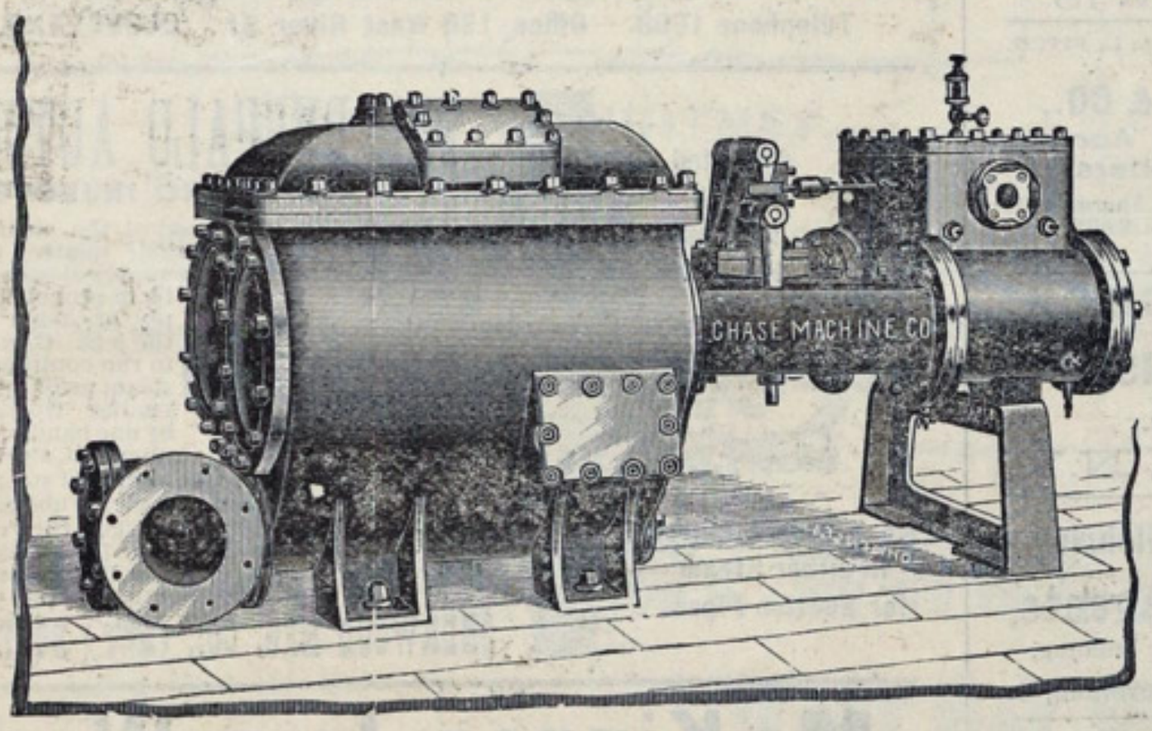

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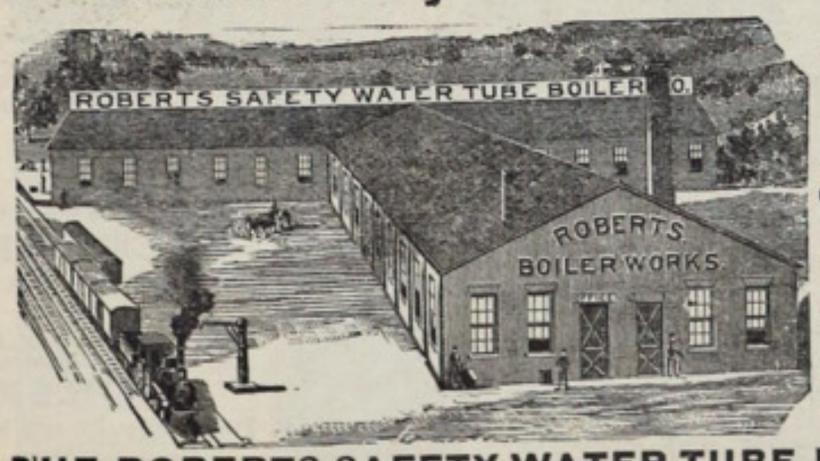

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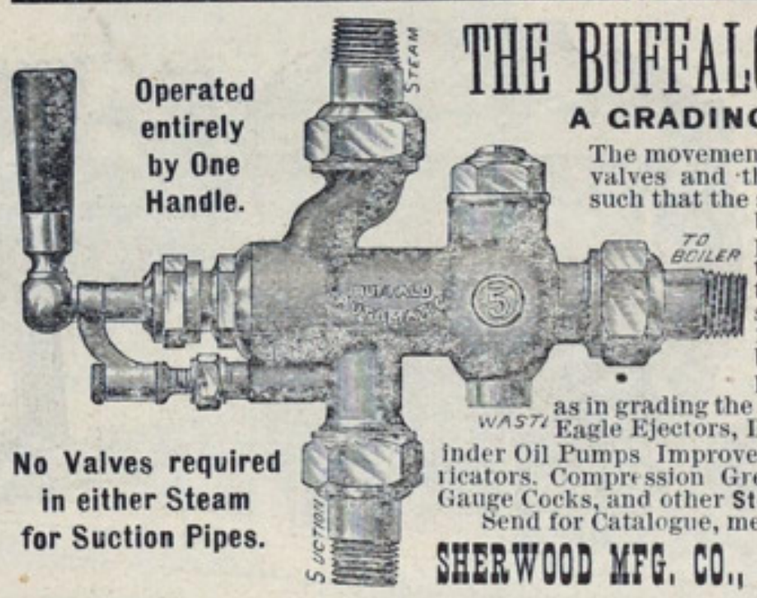

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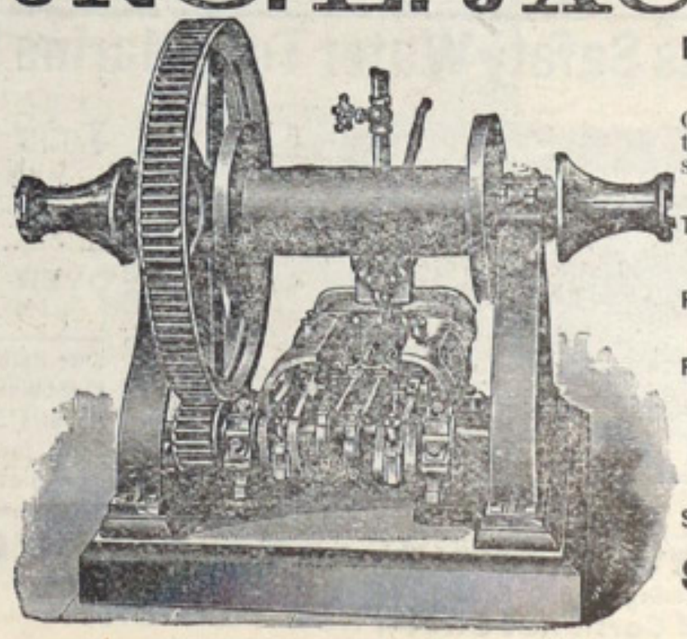

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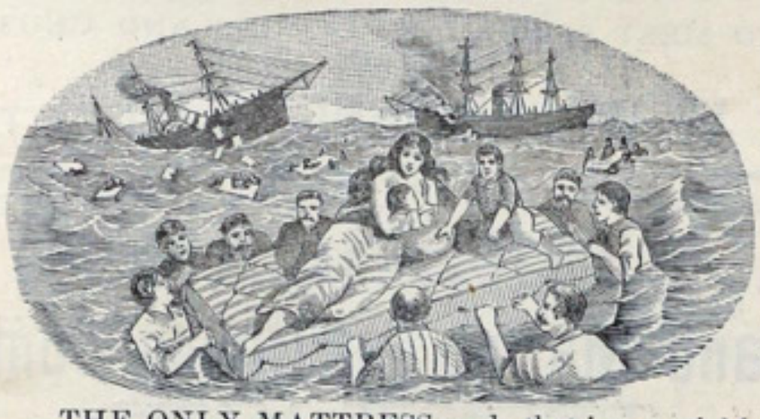

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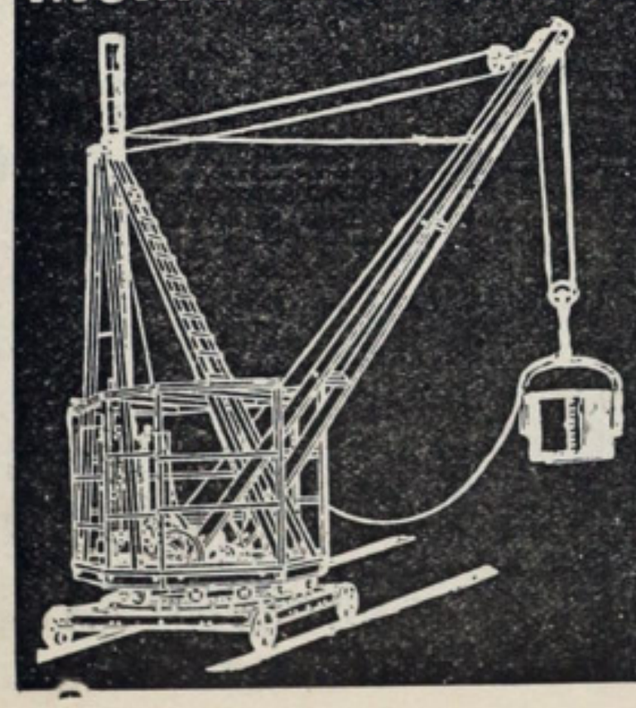

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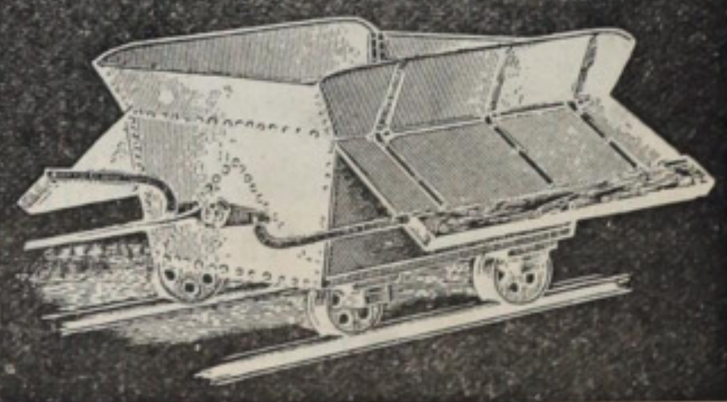

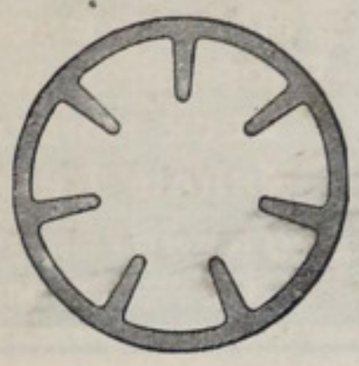

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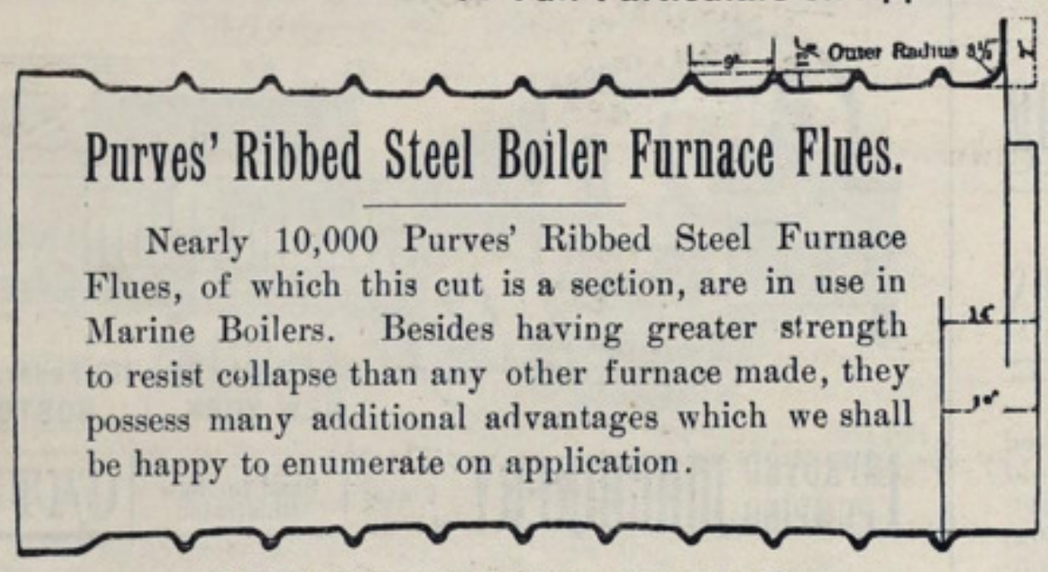

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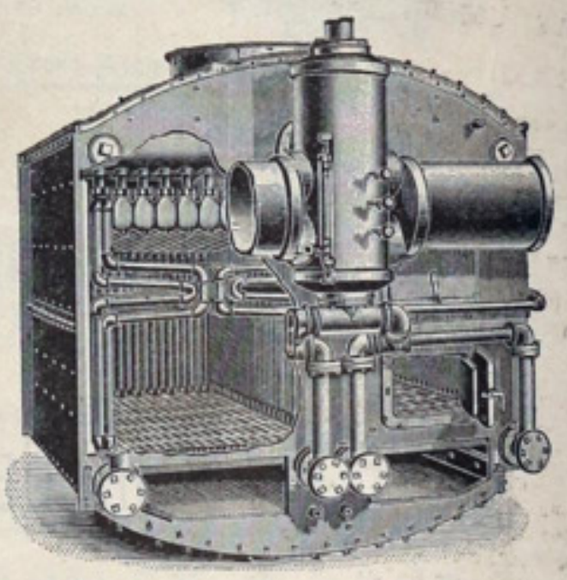

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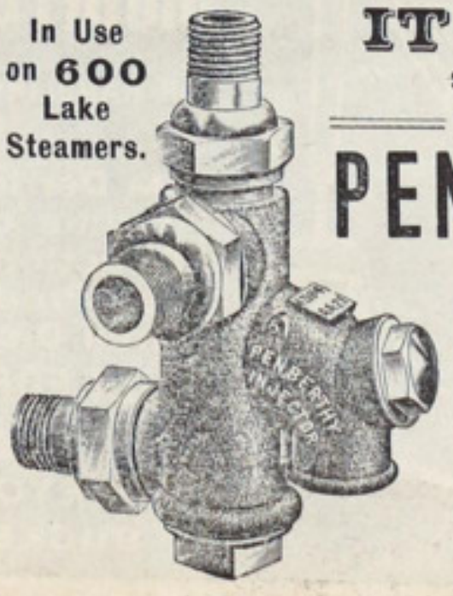

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